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1.	A speech recognition system	for transforming an	acoustic signal	into a stream o	f phonetic
estimat	tes, comprising:				

a frequency analyzer for receiving the acoustic signal and producing as an output a shorttime frequency representation of the acoustic signal;

a novelty processor for receiving the short-time frequency representation of the acoustic signal, separating one or more background components of the representation from one or more region-of-interest components of the representation, and producing a novelty output including the region of interest components of the representation according to one or more novelty parameters;

an attention processor for receiving the novelty output and producing a gating signal as a predetermined function of the novelty output according to one or more attention parameters;

a coincidence processor for receiving the novelty output and the gating signal, and producing a coincidence output that includes co-occurrences between samples of the novelty output over time and frequency, wherein the coincidence output is selectively gated as a predetermined function of the gating signal, so as to produce a gated coincidence output according to one or more coincidence parameters; and,

a vector pattern recognizer and a probability processor for receiving the gated coincidence output and producing a phonetic estimate stream representative of acoustic signal.

- 2. A speech recognition system according to claim 1, wherein the short-time frequency
- 2 representation of the audio signal includes a series of consecutive time instances, each
- 3 consecutive pair separated by a sampling interval, and each of the time instances further includes
- 4 a series of discrete Fourier transform (DFT) points, such that the short-time frequency
- 5 representation of the audio signal includes a series of DFT points.

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- 2 novelty processor (i) calculates a first average value across a first predetermined frequency range
- 3 and a first predetermined time span, (ii) calculates a second average value across a second
- 4 predetermined frequency range and a second predetermined time span, and (iii) subtracts the
- 5 second average value from the first average value so as to produce the novelty output point.
- 1 4. A speech recognition system according to claim 3, wherein the first frequency range, the
- 2 first time span, the second frequency range and the second time span are each a function of one
- 3 or more of the novelty parameters.
- 1 5. A speech recognition system according to claim 3, wherein the first predetermined frequency range is substantially centered about a frequency corresponding to DFT point, and the first predetermined time span is substantially centered about an instant in time corresponding to
- the DFT point.

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- 6. A speech recognition system according to claim 3, wherein the first predetermined frequency range is substantially smaller than the second predetermined frequency range.
- 1 7. A speech recognition system according to claim 3, wherein the first predetermined time span is substantially smaller than the second predetermined time span.
  - 1 8. A speech recognition system according to claim 3, wherein the second predetermined
  - 2 time span is large relative to the second predetermined frequency range.
  - 1 9. A speech recognition system according to claim 3, wherein the second predetermined
  - 2 frequency range is large relative to the second predetermined time span.

- 1 10. A speech recognition system according to claim 3, wherein for each DFT point, the
- 2 novelty processor further calculates one or more additional novelty outputs, and each additional
- 3 novelty output is defined by characteristics including a distinct first frequency range, first time
- 4 span, second frequency range and second time span, each characteristic being a function of one
- 5 or more of the novelty parameters.
- 1 11. A speech recognition system according to claim 2, wherein the coincidence output
- 2 includes a sum of products of novelty output points over two sets of novelty output points.
- 1 12. A speech recognition system according to claim 11, wherein the two sets of DFT points
- 2 includes a first set of novelty output points corresponding to a first instant in time and a second
- 3 set of novelty output points corresponding to a second time instance.
  - 13. A speech recognition system according to claim 11, wherein the two sets of novelty
- output points all correspond to a single time instance.
- 1 14. A speech recognition system according to claim 11, wherein the coincidence processor
- performs the sum of products of novelty output points over two sets of novelty output points
  - according to one or more selectably variable coincidence parameters including time duration,
  - frequency extent, base time, base frequency, delta time, delta frequency, and combinations
  - 5 thereof.

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- 1 15. A speech recognition system according to claim 2, wherein each of the time instances
- 2 further includes an energy value in addition to the series of DFT points.

- 1 16. A speech recognition system according to claim 15, wherein the attention processor (i)
- 2 compares the energy value to a predetermined threshold value according to a comparison
- 3 criterion, so as to produce an energy threshold determination, and (ii) produces the gating signal
- 4 as a predetermined function of the threshold determination.
- 1 17. A speech recognition system according to claim 16, wherein the one or more attention
- 2 parameters include the predetermined threshold value, the comparison criterion and the
- 3 predetermined function of the threshold determination.

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- 1 18. A speech recognition system according to claim 1, wherein the novelty parameters, the
- 2 attention parameters and the coincidence parameters are selected via a genetic algorithm.
  - 19. A speech recognition system for transforming a short-time frequency representation of an acoustic signal into a stream of coincidence vectors, comprising:

a novelty processor for receiving the short-time frequency representation of the audio signal, separating one or more background components of the signal from one or more region of interest components of the signal, and producing a novelty output including the region of interest components of the signal according to one or more novelty parameters;

a coincidence processor for receiving the novelty output and the gating signal, and producing a coincidence vector that includes data describing co-occurrences between samples of the novelty output over time and frequency according to one or more coincidence parameters.

- 1 20. A speech recognition system according to claim 19, further including an attention
- 2 processor for receiving the novelty output and producing a gating signal as a predetermined
- 3 function of the novelty output according to one or more attention parameters, wherein the
- 4 coincidence output is selectively gated as a predetermined function of the gating signal, so as to
- 5 produce a gated coincidence output according to one or more coincidence parameters.

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- 1 21 A speech recognition system according to claim 19, wherein the novelty parameters and
- 2 the coincidence parameters are selected via a genetic algorithm.

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1 22. A method of transforming an acoustic signal into a stream of phonetic estimates, 2 comprising:

receiving the acoustic signal and producing a short-time frequency representation of the acoustic signal;

separating one or more background components of the representation from one or more region of interest components of the representation, and producing a novelty output including the region of interest components of the representation according to one or more novelty parameters;

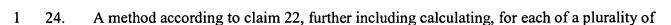
producing a gating signal as a predetermined function of the novelty output according to one or more attention parameters;

producing a coincidence output that includes correlations between samples of the novelty output over time and frequency, wherein the coincidence output is selectively gated as a predetermined function of the gating signal, so as to produce a gated coincidence output according to one or more coincidence parameters; and,

producing a phonetic estimate stream representative of acoustic signal as a function of the gated coincidence output.

- 1 23. A method according to claim 22, further including (i) calculating a first average value
- 2 across a first predetermined frequency range and a first predetermined time span, (ii) calculating
- 3 a second average value across a second predetermined frequency range and a second
- 4 predetermined time span, and (iii) subtracting the second average value from the first average
- 5 value so as to produce the novelty output.





- 2 DFT points from the a short-time frequency representation of the acoustic signal, one or more
- additional novelty outputs, wherein each additional novelty output is defined by characteristics
- 4 including a distinct first frequency range, first time span, second frequency range and second
- 5 time span, each characteristic being a function of one or more of the novelty parameters.
- 1 25. A method according to claim 24, further including performing a sum of products of
- 2 novelty outputs over two sets of novelty outputs according to one or more selectably variable
- 3 coincidence parameters including time duration, frequency extent, base time, base frequency,
- 4 delta time, delta frequency, and combinations thereof.

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- 26. A method according to claim 22, further including comparing the energy value to a predetermined threshold value according to a comparison criterion, so as to produce an energy threshold determination, and (ii) producing the gating signal as a predetermined function of the threshold determination.
  - 27. A method according to claim 22, further including selecting the novelty parameters, the attention parameters and the coincidence parameters via a genetic algorithm.

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